DIAG-3 Resolving the discrepancy between ECE and TS at high Te

|  |  |  |  |
| --- | --- | --- | --- |
| **TG priority:** High | **Start date:** | **Status:**  On-going | **Personnel exchange:** |
| **IO priority:** | **End date:** | **Motivation:** | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device /**  **Association** | **Contact**  **Person** | **2016 TG Request** | **Activity (from JEX/JA spreadsheet)** | | | | |
| **2012** | **2013** | **2014** | **2015** | **2016** |
| C-Mod | A. White | Not doing | Committed | Analysis | Analysis | Done |  |
| DIII-D | M. Austin  A. White | Not doing | Considering | Considering | Considering | Considering |  |
| JET (TS)  (ECE) | M. Maslov  S. Schmuck | Desirable | Considering | Committed | Committed |  |  |
| JT-60U | T. Hatae  A. Isayama | Not doing | Analysis | Analysis | Analysis | Analysis |  |
| FTU | G. Granucci | Not doing | Committed | Committed | Committed |  |  |
| TCV | L. Porte | Not doing |  |  |  | Not doing |  |
| JET, CNR ObECE | C. Sozzi | Desirable |  |  |  |  |  |
| AUG | M. Willens- dorfer | Not doing |  | Considering |  | Analysis |  |
| TFTR | G. Taylor | Not doing |  | Analysis | Analysis |  |  |

**Results for 2015**

JET: Plasmas with Te0 up to 8 keV using NBI heating have been obtained in JET in 2014 during the operation at current between 2<Ip<3 MA. In those plasmas there is a fairly good agreement between ECE and LIDAR core temperature measurements. Such experimental results were obtained after the implementation of a massive calibration analysis of both ECE and LIDAR diagnostics performed during the first half of 2013. Similar results but with slightly lower central temperature (up to 6.5 KeV) were obtained at higher current Ip up to 3.5 MA.

Aggregated data of the electron temperature as measured with ECE and LIDAR (based on the absolute calibration performed in 2010) doesn't show any systematic deviation at high temperatures.

Moreover, a post-campaign calibration of ECE has been performed during 2015 in order to validate the new data acquired.

The reprocessing of the ECE data after the post-campaign calibration has been completed. Only minor differences with respect to the pre-campaign calibration have been found (precision/accuracy of calibration for main spectral domain: <5%, and 5%-10% in specific ranges of Te and Bt).

However a more refined analysis aiming to point out other dependencies, particularly related to the presence of fast particles is under way.

The set of analysis tools has be completed during the first half of 2015. This also includes a routine for the systematic comparison of 2nd and 3rd harmonics ECE temperatures.

Comparison of

-2nd and 3rd harmonics ECE temperatures measured through X mode, perpendicular sight and

-ECE extended spectra through the perpendicular line of sight with the ones through an oblique line of sight

are being performed keeping into account the last calibration.

**Plans for 2016**

JET: The analysis is expected to end by the first semester of 2016. Then, this JEX will be completed.